

CHAPTER 3

ALTERNATIVES CONSIDERED

3.0 INTRODUCTION

The existing RCA configuration does not meet the current FAA Design Standards, as demonstrated in Tables 1-1 and 1-2. Once the new runway and taxiway systems are in place, RCA will comply with the recommended Federal standards and will be a safer public utility for both the flying public and persons on the ground. Alternatives reviewed in the 2000 RCA Master Plan Update and the 2003 ALP Narrative Report were used to develop four viable alternatives for consideration. Two additional alternatives were added in the course of the public participation process, for a total of six alternatives considered.

The 2000 RCA Master Plan Update contained nine airside development options designed to meet projected demands. The narrative report developed for the 2003 update of the Airport Layout Plan describes three development alternatives to achieve runway-taxiway separation requirements that meet current FAA standards. Each of these options was reviewed for consideration as an alternative for this Environmental Assessment. The nine alternatives from the 2000 RCA Master Plan Update and three alternatives from the 2003 ALP Narrative Report are described below.

Master Plan Airside Alternative 1A

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 1000 feet to the south. It also relocated the runway 40 feet to the east. The runway width was retained at 75 feet and the parallel taxiway would be extended to provide efficient airfield circulation and maintain operational safety. Relocation of Tammany Lane to the south would be required to provide a clear runway protection zone. This alternative was removed from further consideration for the following reasons:

- Impacts to Tammany Lane requiring its relocation.
- The extension of the runway 1000 feet south would bring air traffic closer to the existing residential areas south of the airport.
- An additional separation of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Master Plan Airside Alternative 1B

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 1000 feet to the south, maintaining the existing 75 foot runway width. The taxiway would be shifted 40 feet west to provide adequate separation

between the centerline of the taxiway and the runway. This alternative was removed from further consideration for the following reasons:

- Taxiway relocation impacts buildings, 2 FBOs, fuel tanks, pumps, apron space and 4 businesses.
- It impacts Tammany Lane and requires its relocation.
- The extension of the runway 1000 feet south would bring air traffic closer to existing residential areas south of the airport.
- An additional separation of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Master Plan Airside Alternative 2A

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 1000 feet to the north, maintaining the existing 75 foot runway width. The runway would be shifted 40 feet to the east to meet separation requirements. This alternative would require excavation a portion of a hill to the north and crossing of Gird Creek. This option was eliminated from further consideration for the following reasons:

- A shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Master Plan Airside Alternative 2B

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 1000 feet to the north, maintaining the existing 75 foot runway width. The taxiway would be relocated west 40 feet and extended to the end of the north extension of the runway. The relocation of the taxiway impacts thirteen buildings west of the taxiway and relocation and reconfiguration of the two fixed-base operators, fuel tank farms, and pumps and apron space. This option was removed from further consideration for the following reasons:

- Taxiway relocation impacts buildings, 2 FBOs, fuel tanks, pumps, apron space and 4 businesses.
- A shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Master Plan Airside Alternative 3A

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 500 feet north and 500 feet south, maintaining the existing 75 foot runway width. The runway would also be shifted 40 feet east to provide adequate runway-taxiway separation. The northern extension would require excavation of the hill north of the runway to provide adequate clearances. The runway would be located closer to Tammany Lane to the south presenting possible obstructions. This option was eliminated from further consideration for the following reasons:

- It impacts resources and facilities at both ends of the runway. Alternative 3A has the same impacts as the alternatives which extend the runway north or south.
- A shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Master Plan Airside Alternative 3B

This alternative provided for an extension of the runway to an overall length of 5200 feet by extending the runway 500 feet north and 500 feet south, maintaining the existing 75 foot runway width. The taxiway would be relocated 40 feet to the west. This option was eliminated from further consideration for the following reasons:

- Taxiway relocation impacts buildings, 2 FBOs, fuel tanks, pumps, apron space and 4 businesses.
- A shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the master plan.

Master Plan Airside Alternative 4

This alternative identified a new 5200 foot x 75 foot runway oriented between 30 and 45 degrees counter-clockwise to the existing runway. This option would also include construction of a parallel taxiway along the runway and connection to the existing taxiways. Smaller aircraft could continue to use the current Runway 16-34, with the new runway available for use by the critical design aircraft. This alternative was eliminated from further consideration for the following reasons:

- Substantial land acquisition requirements.
- Substantial land acquisition and construction costs.

Master Plan Airside Alternative 5

This alternative called for construction of a new 5200 foot by 75 foot runway and parallel taxiway sufficiently far east of the existing runway to allow for continued use of the

existing runway by smaller aircraft. This alternative would require relocation of both Tammany Lane and Stock Farm Road. This alternative was eliminated from further consideration for the following reasons:

- Substantial land acquisition requirements.
- Substantial construction costs.
- The airport use does not justify the need for an additional runway to operate simultaneously.

Master Plan Airside Alternative 6

This alternative involved the shifting of the existing runway centerline 40 feet to the east but maintaining the runway length at the existing 4200 foot length. This was the selected alternative for the Master Plan, however, it has been removed from consideration in this Environmental Assessment because a runway shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the Master Plan.

Airport Layout Plan Narrative Report Alternative 1

This alternative called for the widening of the existing runway by 40 feet and shifting the runway centerline accordingly. This option was eliminated from further consideration for the following reasons:

- A shift of 40 feet is no longer adequate to meet FAR Part 77 transitional surface requirements due to construction of new buildings since completion of the airport layout plan narrative report.

Airport Layout Plan Narrative Report Alternative 2

This alternative involved shifting the runway 240 feet east of its present location. This alternative was examined within this Environmental Assessment as Alternative 3.

Airport Layout Plan Narrative Report Alternative 3

This alternative involved shifting the runway 400 feet east of its present location. This alternative was further examined within this Environmental Assessment as Alternative 4.

Relocation of the airport was also considered. A review of the Master Plan Update and a quadrangle map reconnaissance (south of Hamilton to north of Victor) was conducted by the Consultant. According to the Master Plan Update approximately 200 acres of land suitable for development would be needed. Criteria such as 2% maximum grade of the terrain, drainage, utilities, avoiding populated areas, unobstructed approach and departure paths, and convenient access among others, are all necessary for a viable airport site. The Part 77 surfaces, as noted on the Airspace drawing of the Airport Layout Plan attached in Appendix V – Airport Plans and Construction, were also reviewed for possible obstruction issues. Applying these criteria to the quadrangle maps from south of Hamilton to north of Victor verifies that there are no viable sites for another airport.

The six viable alternatives evaluated as part of this Environmental Assessment are as follows:

Alternative 1 – No Action;

Alternative 2 – Relocate Runway 95 feet east, shift Runway 34 threshold 600 feet north in initial phase, 1000 foot extension to north in Phase 2.

Alternative 2A – Relocate Runway 93 feet east, shift Runway 34 threshold 1000 feet north, 1000 foot extension to north in Phase 2.

Alternative 3 – Relocate Runway 240 feet east, shift Runway 34 threshold 600 feet north in initial phase, 1000 foot extension to north in Phase 2

Alternative 3A – Relocate Runway 240 feet east, shift Runway 34 threshold 1550 feet north in initial phase, 1000 foot extension to north in Phase 2.

Alternative 4 – Relocate Runway 400 feet east, shift Runway 34 threshold 600 feet north in initial phase, 1000 foot extension to north in Phase 2.

Alternatives 1, 2, 3 and 4 were originally evaluated as a part of this Environmental Assessment. In response to issues raised during the public participation process Alternatives 2 and 3, were modified and added as Alternative 2A and 3A.

3.1 ALTERNATIVE 1 – No Action:

This Alternative includes:

- Keeping the runway at its present length and location, and
- Not developing areas for future aviation growth.

3.1.1 ANALYSIS

This alternative explored the possibility of keeping the runway at its present 4,200-foot length and at the existing location. However, in its present location and configuration, RCA does not meet the FAA design standards, FAR Part 77 imaginary surfaces and does not safely accommodate the current aviation needs. This option would not provide for the purchase of additional land to protect the airport and buffer adjacent neighborhoods.

The poor condition of taxiway, apron, and runway pavements, as explained in Appendix V, *Airport Plans and Construction*, would require Ravalli County to continually be involved in a major maintenance program. By not providing an airport that meets the recommended standards justified by current use, it is possible that the State Division of Aeronautics and the Federal Aviation Administration would not grant funds to the airport, thus leaving the task of airport development and financing up to the local sponsor, Ravalli County.

3.1.2 ENVIRONMENTAL IMPACTS/MITIGATION

Residential development is located just south of the present Runway 34 threshold. The 'No Action' alternative keeps the runway activity in closer proximity to the residential development, as opposed to the other alternatives. Therefore, the noise created by over-flight of aircraft over the neighborhood south of the airport would increase more than with other alternatives. Noise is the only affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport usage increases, regardless of any improvements being made.

3.1.3 CONCLUSION

Alternative 1 does not provide for runway/taxiway separation and runway length for the type of aircraft currently using and forecast to use the airport during the next twenty years. Therefore, this alternative does not meet the Purpose and Need.

3.2 ALTERNATIVE 2 – Relocate Runway 95 Feet East, Shift Threshold 600 Feet North:

Alternative 2 includes:

- Relocating runway 95 feet east of existing alignment at initial length of 4200 feet,
- Shifting the Runway 34 threshold 600 feet to the north in initial phase,
- 1000 foot extension of runway in Phase 2 to the north, for ultimate 75-foot x 5,200-foot runway,
- Removing the existing runway and lighting system,
- Relocating the existing Precision Approach Path Indicators (PAPIs), and installing new medium intensity runway lighting system,
- Acquiring 71 acres of land for runway, apron, taxiway, and development,
- Acquiring or rezoning up to 99.5 acres of land for compatible land use (65 DNL boundary outside of the minimum required land acquisition),
- Maintaining current weight bearing capacity of 17,000 pounds,
- Reconstructing Taxiway B (parallel taxiway) and connector taxiways.

3.2.1 ANALYSIS

This alternative moves the existing runway centerline 95 feet to the east in order to meet the minimum runway/taxiway separation requirement of 240 feet. This alternative, however, would provide a runway/taxiway separation of 295 feet. The relocation of the runway 55 feet further east than required by the FAA design standards is necessary to prevent existing buildings from penetrating the Federal Aviation Regulations (FAR) Part 77 Transitional Surface. These buildings would be obstructions as defined by Part 77 if the runway was placed at 240 feet.

This alternative would not require as much land for development as Alternative 2A, 3, 3A or 4. However, 71 acres would still be required to the north and east for the extension and relocation of the runway and acquisition or rezoning of 99.5 acres of land for compatible land use. The Daly Ditches Irrigation buildings would penetrate the Part 77 approach surface under this option. This alternative would require the acquisition and relocation or removal of these buildings. The need to acquire and relocate or remove these structures increases the costs of this option.

This alternative would result in the closure of the airport due to the proximity of the construction to the existing runway. This would likely result in increased construction costs for requiring the contractor to work extended (potentially 24-hour) shifts for three to six months. The closure of the airport during construction would result in economic loss to the Hamilton area, and especially to the airport tenants who would have to close their businesses or relocate temporarily to other airports in the area.

The cost of this option is nearly the same as that of building a new runway further to the east, with increased construction costs offsetting the savings in land acquisition.

However, this cost comparison does not include the economic loss to the users and tenants of the airport resulting from the temporary airport closure.

3.2.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 2 may result in displacement of species that utilize the Gird Creek riparian area and the upland areas adjacent to the existing airport development area as cover, forage, breeding and movement habitat. However, large quantities of adjacent suitable habitat exists that can support species that are displaced by construction activities and the resulting modification of the project area. Therefore no adverse effects to general wildlife species are anticipated.

This alternative requires the removal or relocation of two historic airplane hangars known as the Daly Ditches Irrigation buildings in order to provide clearance of FAR Part 77 imaginary surfaces. A cultural resources mitigation plan has been developed to mitigate the project's adverse effects to the buildings. Acceptance and approval of the cultural resources mitigation plan would result in the elimination of impacts to cultural resources that would result from implementation of Alternative 2.

Alternative 2 shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made.

Depending on final runway elevations and grading requirements of the runway extension, Alternative 2 impacts up to 2.8 acres of jurisdictional wetlands and waters of the U.S. Completion of this alternative would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available within the same watershed as the airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

3.2.3 CONCLUSION

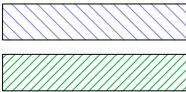
Alternative 2 meets FAA design standards for runway/taxiway separation and provides clearance of FAR Part 77 surfaces. It provides limited area for expansion of apron and hangar area. Implementation of Alternative 2 does not produce significant impacts to the environmental categories identified for evaluation under NEPA.

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NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).
2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.
3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.
4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.
5. LARGE RPZ UTILIZED (500 X 700 X 1000)
6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE AND THE EXTENTS OF THE RUNWAY PROTECTION ZONE.

LEGEND

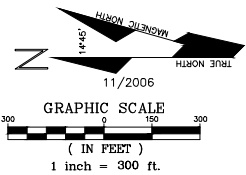


MINIMUM REQUIRED LAND ACQUISITION **	71.3 ACRES
COMPATIBLE LAND USE AREA ***	99.5 ACRES

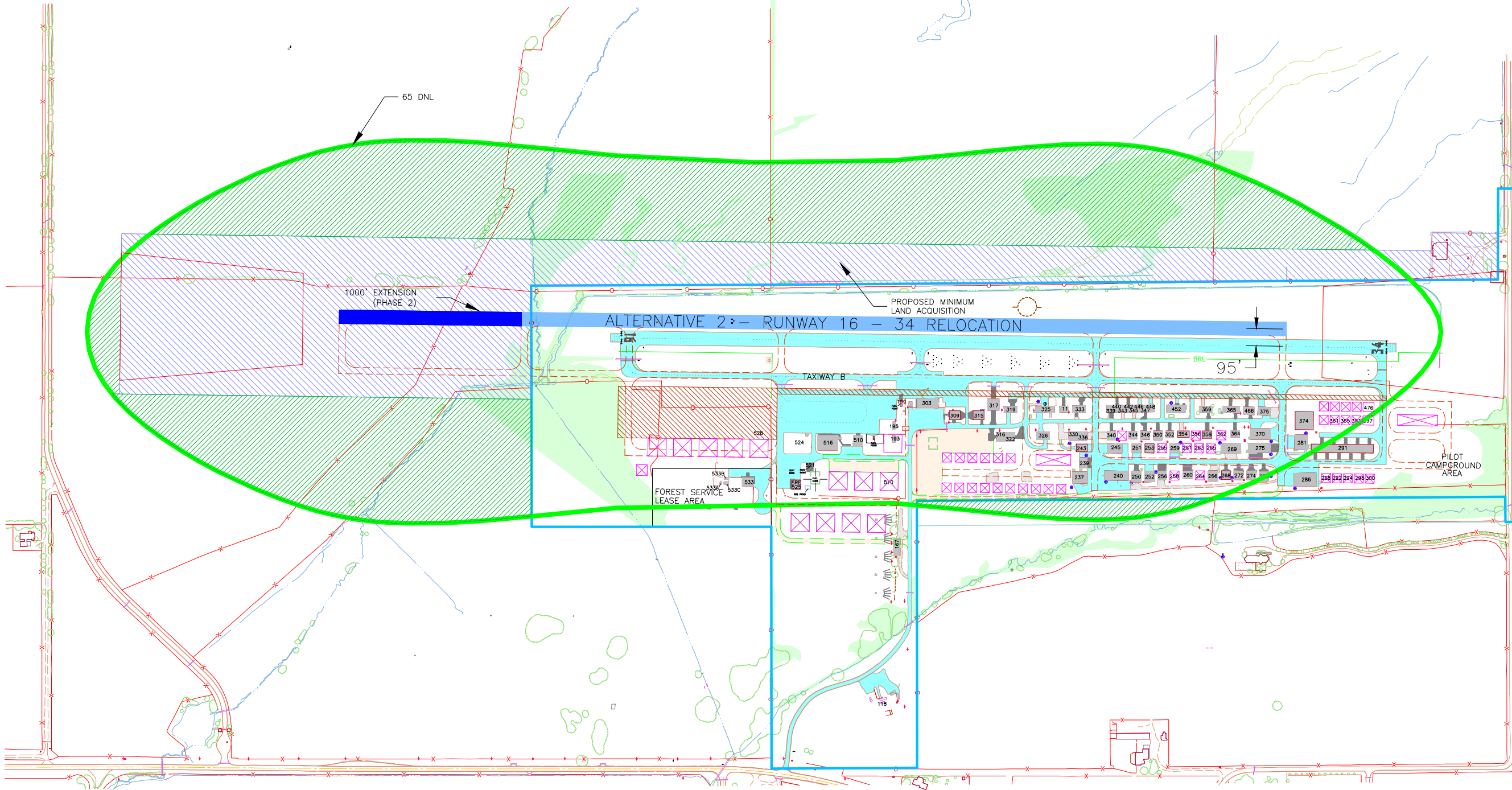
* BUILDING SQUARE FOOTAGE AVAILABLE BASED ON PROPOSED BUILDING LAYOUT PRESENTED ABOVE. FUTURE BUILDINGS WITH ASSIGNED NUMBERS ARE EXISTING LEASES AND ARE NOT INCLUDED IN FUTURE AVAILABLE SF.

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.

*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.



LEGEND	
	EXISTING FUTURE
PAVEMENT	
BUILDING	
BUILDING AFTER RW RELOCATION	
AVIATION RELATED BUSINESS	
FENCE	
GRAVEL	
AIRPORT BOUNDARY	
ADJACENT PROPERTY	
OFA (OBJECT FREE AREA)	
OPZ (OBSTACLE FREE ZONE)	
RPZ (RUNWAY PROTECTION ZONE)	
RSA (RUNWAY SAFETY AREA)	
BRL (BUILDING RESTRICTION LINE)	
IRRIGATION DITCH / CREEKS	
WETLANDS	
CONTROL POINT	
AIRPORT REFERENCE POINT	
POTENTIAL APRON EXPANSION	
AREA REQ'D MIN. LAND ACQUISITION	
65 DNL AREA OUTSIDE ALP BOUNDARY	



RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT

MONTANA

HAMILTON

PROJECT NO.
0877

SHEET NUMBER
ALT 2

DRAWING NUMBER

ALT 2

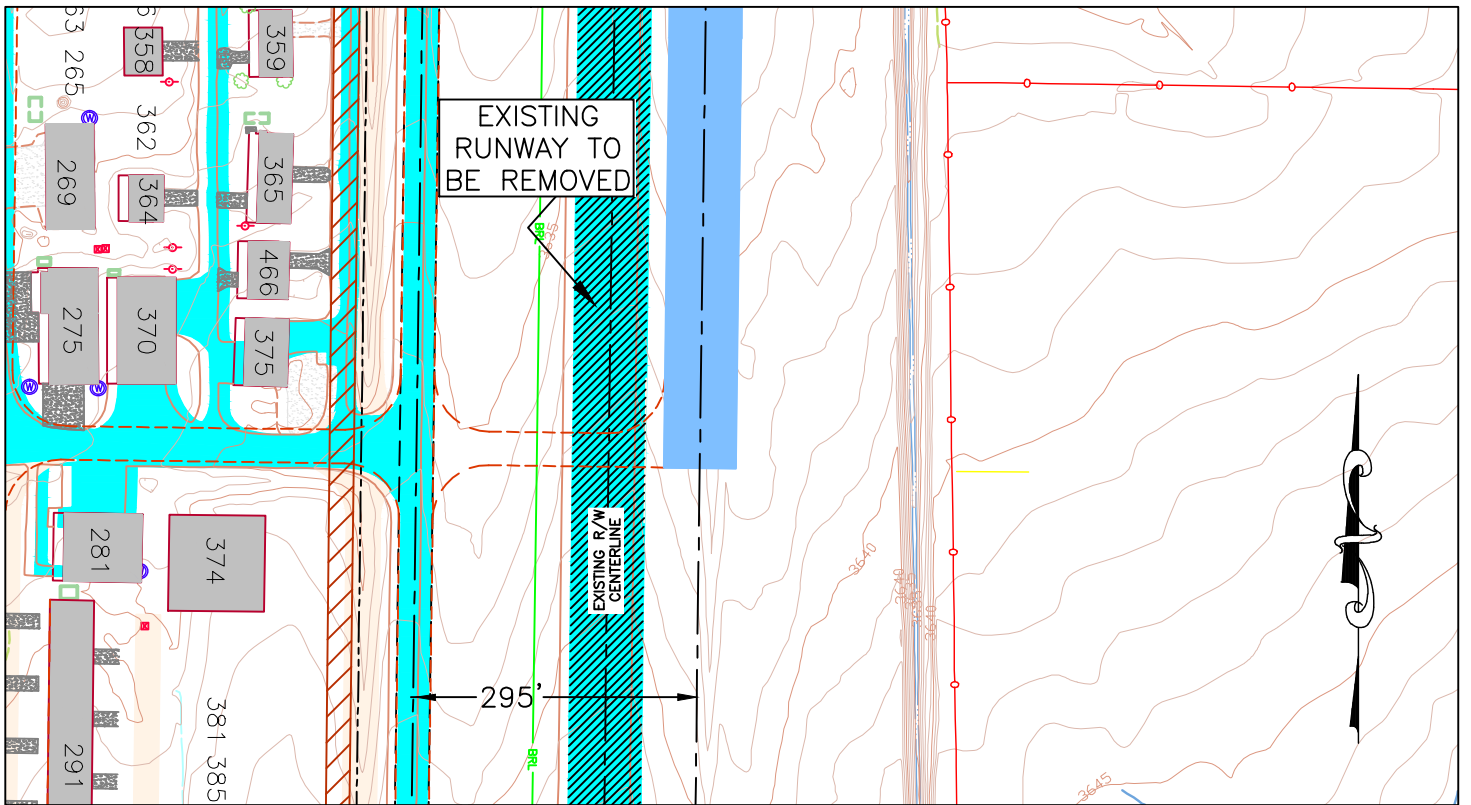
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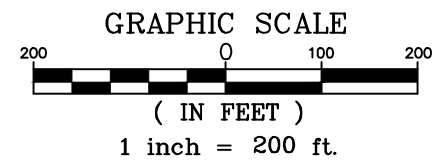
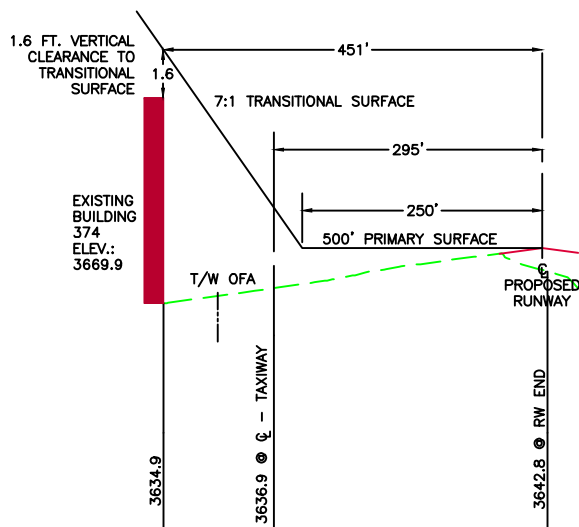
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VERIFY SCALE!
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MODIFY SCALE
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ALTERNATIVE 2
RELOCATE RUNWAY
CENTERLINE 95 FEET EAST,
600 FEET NORTH



3.3 ALTERNATIVE 2A – Relocate Runway 93 Feet East, Shift Threshold 1000 Feet North:

Alternative 2A includes:

- Relocating runway 93 feet east of existing alignment at initial length of 4200 feet,
- Shift runway 1000' to north in Phase 1.
- 1000 foot extension of runway in Phase 2 to the north, for ultimate 75-foot x 5,200-foot runway,
- Acquiring approximately 58 acres for runway development and safety areas initially and 20 acres additional in Phase 2,
- Acquiring or zone approximately 106 acres for compatible land use (65 DNL boundary outside of the minimum required land acquisition),
- Maintaining current weight bearing capacity of 17,000 pounds,
- Removing the existing runway and lighting system,
- Relocating the existing Precision Approach Path Indicators (PAPIs), and installing new medium intensity runway lighting system,
- Reconstructing Taxiway B (parallel taxiway) and connector taxiways.

3.3.1 ANALYSIS

This alternative moves the existing runway centerline 93 feet to the east in order to meet the minimum runway/taxiway separation requirement of 240 feet. This alternative, however, would provide a runway/taxiway separation of 293 feet. The relocation of the runway 53 feet further east than required by the FAA design standards is necessary to prevent existing buildings from penetrating the Federal Aviation Regulations (FAR) Part 77 Transitional Surface. These buildings would be obstructions as defined by Part 77 if the runway was placed at 240 feet.

This alternative would not require as much land for development as Alternative 3, 3A or 4. However, 78 acres would still be required to the north and east for the relocation of the runway.

This alternative would result in the closure of the airport due to the proximity of the construction to the existing runway. This would likely result in increased construction costs for requiring the contractor to work extended (potentially 24-hour) shifts for three to six months. The closure of the airport during construction would result in economic loss to the Hamilton area, and especially to the airport tenants who would have to close their businesses or relocate temporarily to other airports in the area.

The cost of this option is nearly the same as that of building a new runway further to the east, with increased construction costs offsetting the savings in land acquisition. However, this cost comparison does not include the economic loss to the users and tenants of the airport resulting from the temporary airport closure.

3.3.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 2A may result in displacement of species that utilize the Gird Creek riparian area and the upland areas adjacent to the existing airport development area as cover, forage, breeding and movement habitat. However, large quantities of adjacent suitable habitat exists that can support species that are displaced by construction activities and the resulting modification of the project area. Therefore no adverse effects to general wildlife species are anticipated.

Alternative 2A shifts the Runway 34 threshold 1000' further to the north and away from Tammany Lane. Due to the 1000' shift northward, this alternative provides clearance of FAR Part 77 imaginary surfaces for the two historic airplane hangars known as the Daly Ditches Irrigation buildings. Therefore, this alternative does not require the removal or relocation of the historic buildings resulting in elimination of impacts to cultural resources and reduced project costs.

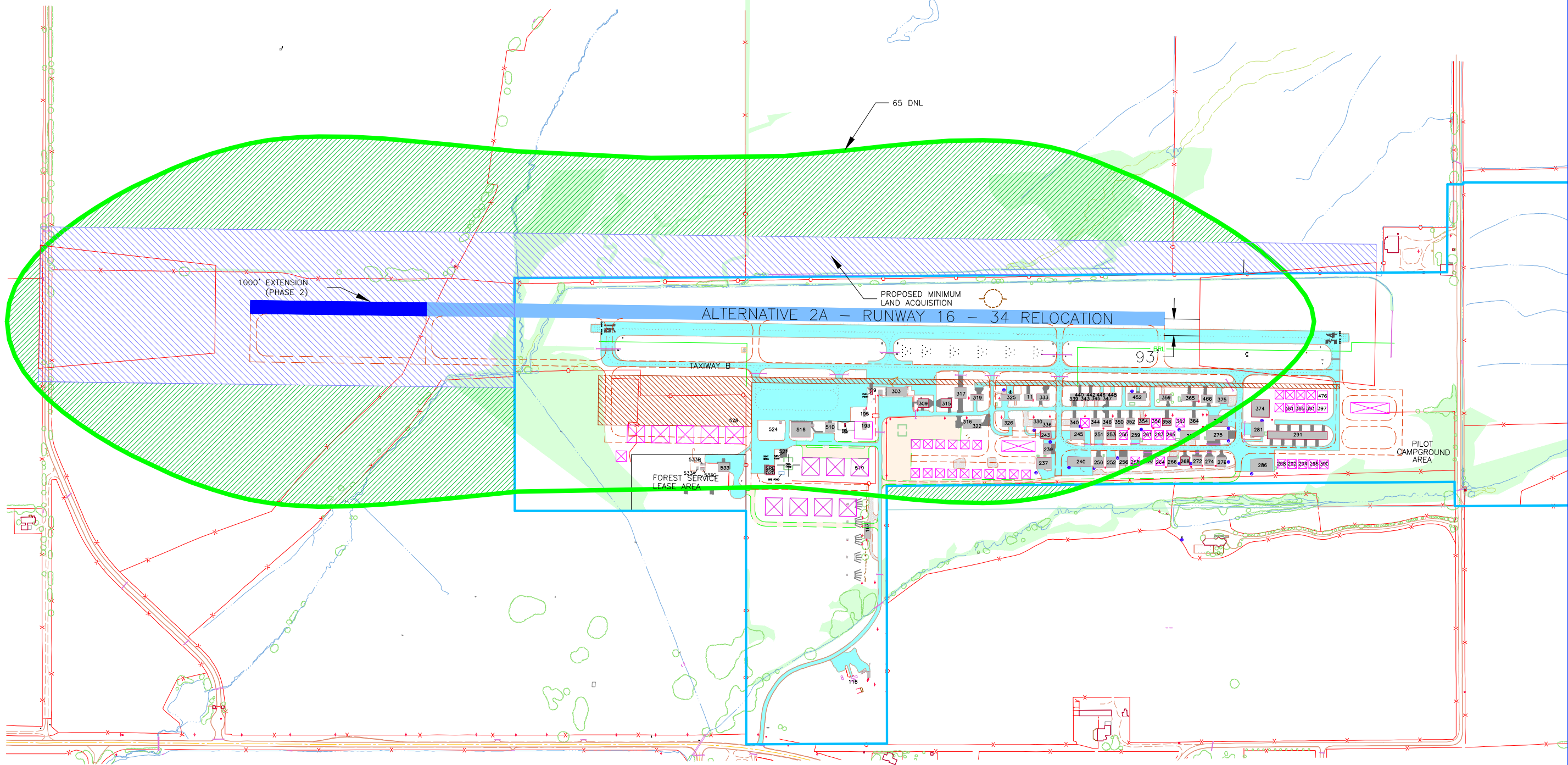
Shifting of the threshold also increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made.

Depending on final runway elevations and grading requirements of the runway extension, Alternative 2A impacts up to 2.8 acres of jurisdictional wetlands and waters of the U.S. Completion of this alternative would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available within the same watershed as the airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

3.3.3 CONCLUSION

Alternative 2A meets FAA design standards for runway/taxiway separation and provides clearance of FAR Part 77 surfaces. It provides limited area for expansion of apron and hangar area. Implementation of Alternative 2A does not produce significant impacts to the environmental categories identified for evaluation under NEPA. In contrast to Alternatives 2, 3 and 4, Alternative 2A does not require removal or relocation of the Daly Ditches Irrigation buildings resulting in reduced impacts to cultural resources and reduced project costs.

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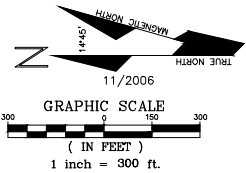
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LEGEND	
	MINIMUM REQUIRED LAND ACQUISITION **
	COMPATIBLE LAND USE AREA ***

MINIMUM REQUIRED LAND ACQUISITION **	78.0 ACRES
COMPATIBLE LAND USE AREA ***	106.0 ACRES

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.
*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.



LEGEND	
	EXISTING FUTURE
PAVEMENT	
BUILDING	
BUILDING AFTER RW RELOCATION	
AVIATION RELATED BUSINESS	
FENCE	
GRAVEL	
AIRPORT BOUNDARY	
ADJACENT PROPERTY	
OFA (OBJECT FREE AREA)	
OPZ (OBSTACLE FREE ZONE)	
RPZ (RUNWAY PROTECTION ZONE)	
RSA (RUNWAY SAFETY AREA)	
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AREA REQ'D MIN. LAND ACQUISITION	
65 DNL AREA OUTSIDE ALP BOUNDARY	

RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT

MONTANA

HAMILTON

ALTERNATIVE 2A

PROJECT NO.
0877
SHEET NUMBER
ALT 2
DRAWING NUMBER

ALT 2A

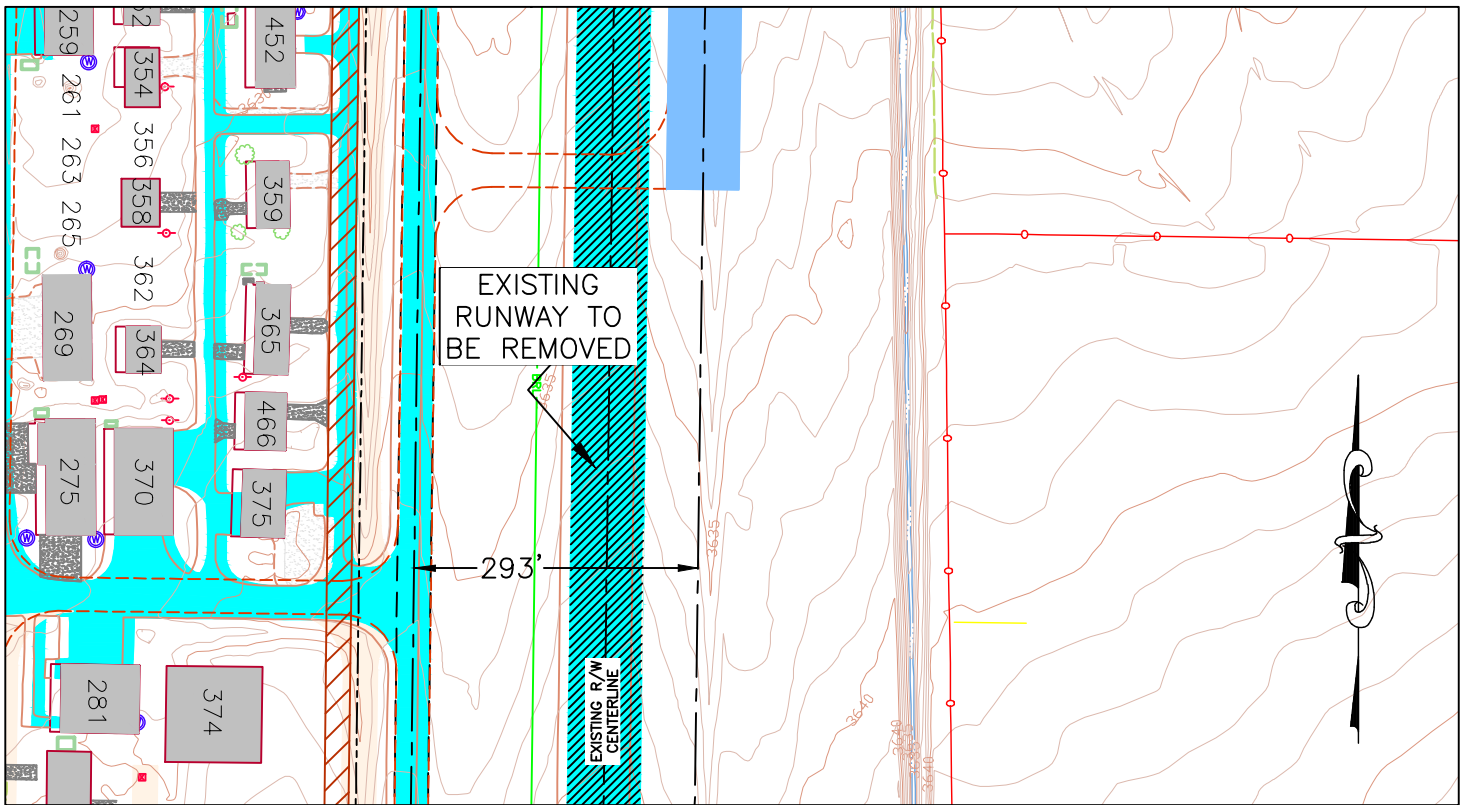
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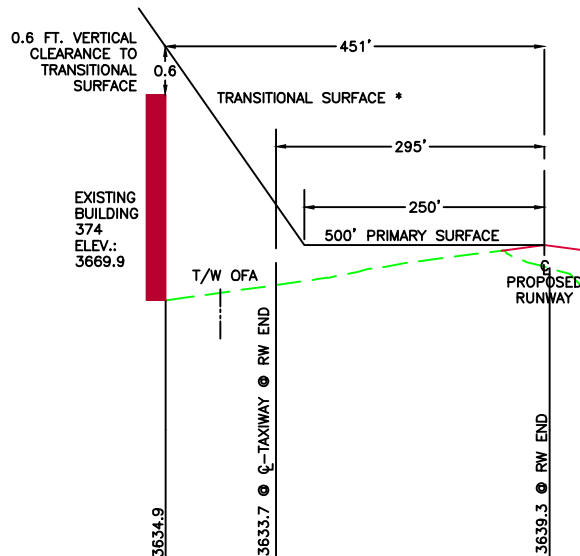
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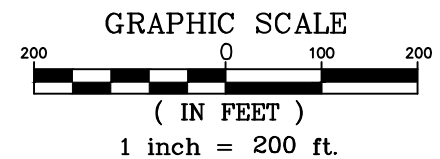
VERIFY SCALE
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REPRESENTS ORIGINAL
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MODIFY SCALE
ACCORDINGLY



ALTERNATIVE 2A
RELOCATE RUNWAY
CENTERLINE 93 FEET EAST,
1000 FEET NORTH



* TRANSITIONAL SURFACE SLOPE INCREASES ABOVE 7:1 TO MEET
APPROACH SURFACE BEGINNING 200' BEYOND RUNWAY END



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3.4 ALTERNATIVE 3 – Relocate Runway 240 Feet East, Shift Threshold 600 Feet to the North:

Alternative 3 includes:

- Relocating runway 240 feet east of existing alignment at initial length of 4200 feet,
- Shifting the Runway 34 threshold 600 feet to the north in initial phase,
- 1000 foot extension of runway in Phase 2 to the north, for ultimate 75-foot x 5,200-foot runway,
- Relocating the PAPIs, and installing new runway lighting,
- Converting and extending the present runway to a parallel taxiway once the new runway alignment is available for use,
- Acquiring 88.1 acres of land for runway, apron, taxiway, and hangar development,
- Acquiring up to 98.3 acres of land through easement for compatible land use (65 DNL boundary outside of the minimum required land acquisition),
- Maintaining current weight bearing capacity of 17,000 pounds,
- Reconstructing Taxiway B (parallel taxiway) and connector taxiways.

3.4.1 ANALYSIS

By moving the runway 240 feet east, the building restriction line also moves further east, which in turn, removes the existing structures from impacting the Part 77 Transitional Surfaces. This alternative does not, however, provide the setback distance required for new hangar construction west of the existing runway and east of the existing parallel taxiway. Hangar construction in this area would penetrate the Transitional Surface as shown on the exhibit “Relocate Existing Runway Alternative 3” and Drawing “ALT 3.” One additional hangar may be constructed at the south end of the parallel taxiway, as identified on Drawing “ALT 3.” Modifications to the hangar layout may achieve a layout that would provide for additional hangar spaces, but likely at the expense of reducing available ramp area.

This alternative also provides for the development of a sizeable apron expansion to the west of the existing runway. While this space would be large enough to allow for flexibility in hangar location, taxilane location, and staging of apron construction, it is not the most advantageous type of layout for an apron due to the long narrow nature of the proposed area. Such a layout would reduce the ability to nest planes together in several rows and likely only provide for one row of planes to be parked wing to wing, or possibly up to one row of planes nested (wing to tail parking).

Alternative 3 could allow for the airport to remain open during the majority of the runway construction with limited runway closures or night work while connecting the new runway to the exiting runway and taxiways.

This alternative would require acquisition of 88.1 acres of land to the north and east for the extension and relocation of the runway, and acquisition or rezoning of 98.3 acres of land for compatible land use.

3.4.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 3 may result in displacement of species that utilize the Gird Creek riparian area and the upland areas adjacent to the existing airport development area as cover, forage, breeding and movement habitat. However, large quantities of adjacent suitable habitat exists that can support species that are displaced by construction activities and the resulting modification of the project area. Therefore no adverse effects to general wildlife species are anticipated.

This alternative requires the removal or relocation of two historic airplane hangars known as the Daly Ditches Irrigation buildings in order to provide clearance of FAR Part 77 imaginary surfaces. A cultural resources mitigation plan has been developed to mitigate the project's adverse effects to the buildings. Acceptance and approval of the cultural resources mitigation plan would result in the elimination of impacts to cultural resources that would result from implementation of Alternative 3.

Alternative 3 shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made. Conceptual mitigation includes land acquisition of those parcels along the easterly boundary of the airport that would be impacted by noise levels beyond the acceptable threshold limits.

Based on wetland delineation and jurisdictional determination by the Army Corps of Engineers (COE), it was determined that the proposed improvements could impact up to 1.99 acres of wetlands. The proposed improvements would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available for the proposed action within the same watershed as the airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

3.4.3 CONCLUSION

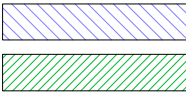
Alternative 3 meets FAA design standards for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years. Alternative 3 provides additional hangar and apron space compared with Alternatives 2 and 2A. Implementation of Alternative 3 does not produce significant impacts to the environmental categories identified for evaluation under NEPA.

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NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).
2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.
3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.
4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.
5. LARGE RPZ UTILIZED (500 X 700 X 1000)
6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE AND THE EXTENTS OF THE RUNWAY PROTECTION ZONE.

LEGEND

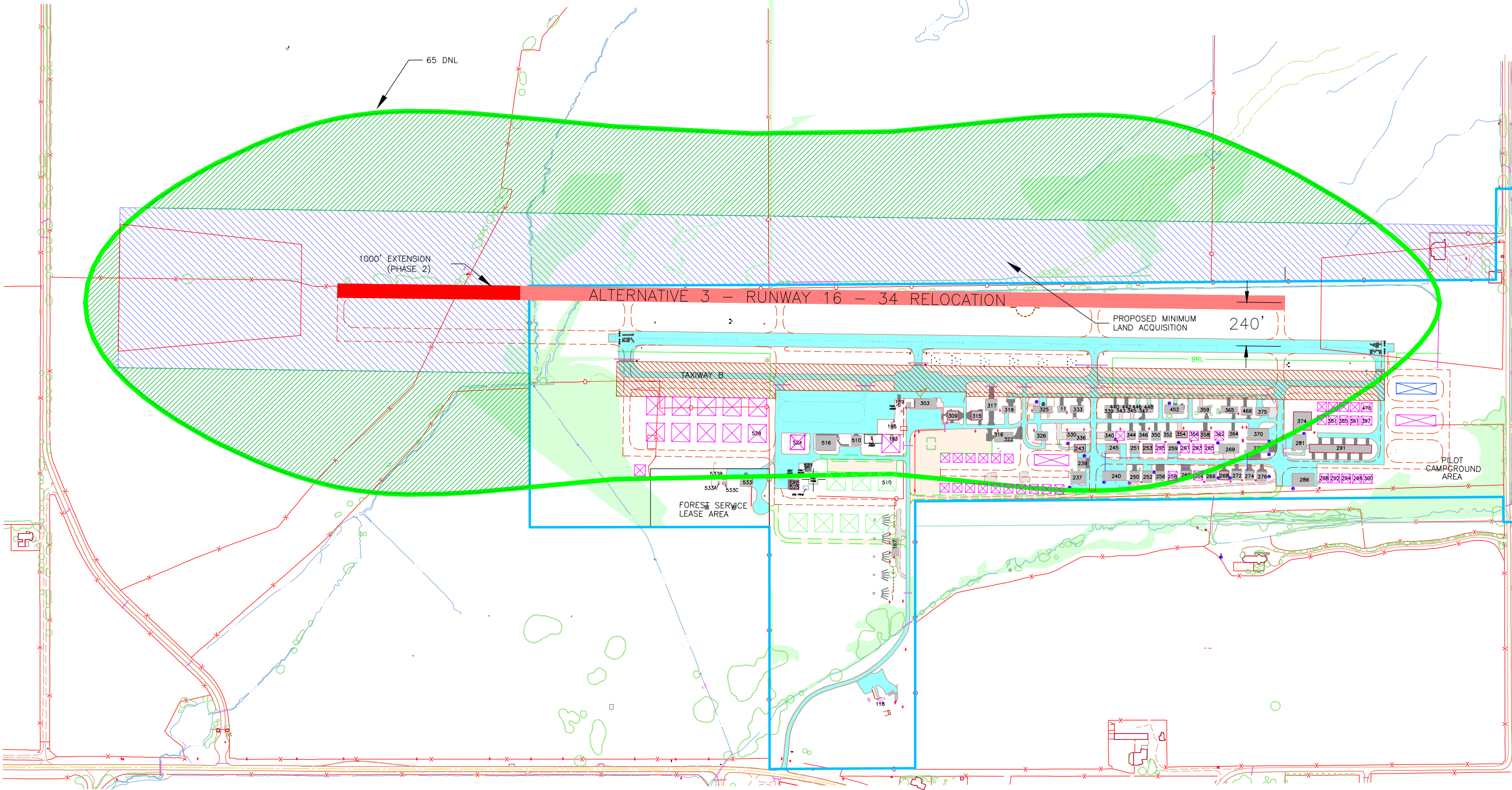
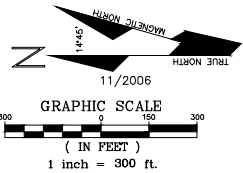


MINIMUM REQUIRED LAND ACQUISITION **	88.1 ACRES
COMPATIBLE LAND USE AREA ***	98.3 ACRES

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.

*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.

LEGEND	
	EXISTING FUTURE
PAVEMENT	
BUILDING	
BUILDING AFTER RW RELOCATION	
AVIATION RELATED BUSINESS	
FENCE	
GRAVEL	
AIRPORT BOUNDARY	
ADJACENT PROPERTY	
OFA (OBJECT FREE AREA)	
OPZ (OBSTACLE FREE ZONE)	
RPZ (RUNWAY PROTECTION ZONE)	
RSA (RUNWAY SAFETY AREA)	
BRL (BUILDING RESTRICTION LINE)	
IRRIGATION DITCH / CREEKS	
WETLANDS	
CONTROL POINT	
AIRPORT REFERENCE POINT	
POTENTIAL APRON EXPANSION	
AREA REQ'D MIN. LAND ACQUISITION	
65 DNL AREA OUTSIDE ALP BOUNDARY	



RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT

MONTANA

HAMILTON

ALTERNATIVE 3

PROJECT NO.
0877
SHEET NUMBER
ALT 3
DRAWING NUMBER

ALT 3

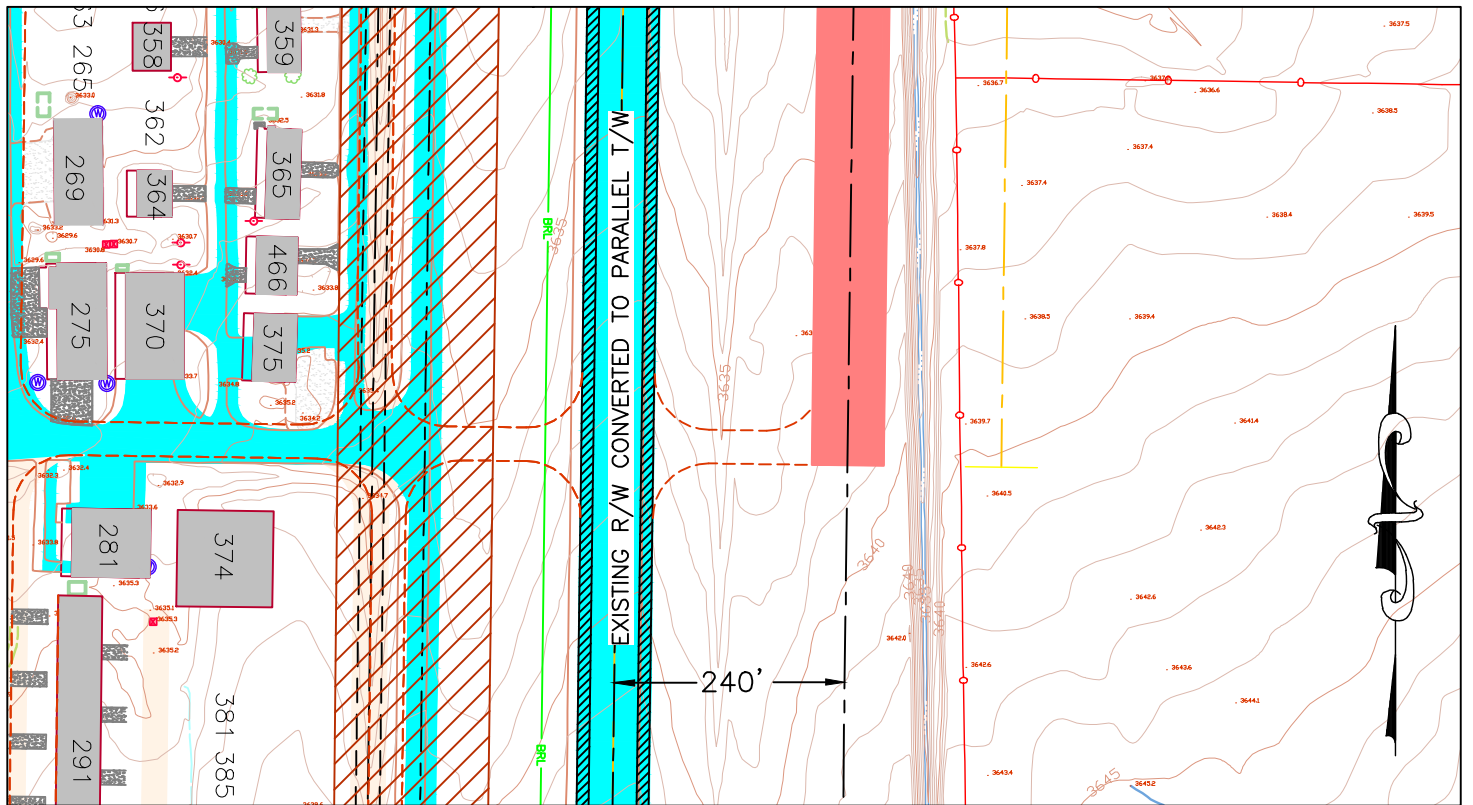
MORRISON
MAERLE, INC.
An Employee-Owned Company
2621 South Clark Street, Missoula, MT, 59801
Phone: (406) 542-8880 Fax: (406) 542-0009
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ENGINEERS
SURVEYORS
PLANNERS
COPYRIGHT © MORRISON MAERLE, INC. 2000

DRAWN BY: TJE
CHK'D BY: MAM
APPR. BY: STB
DATE: 10-09
BY: O.A. REVIEW
DATE:

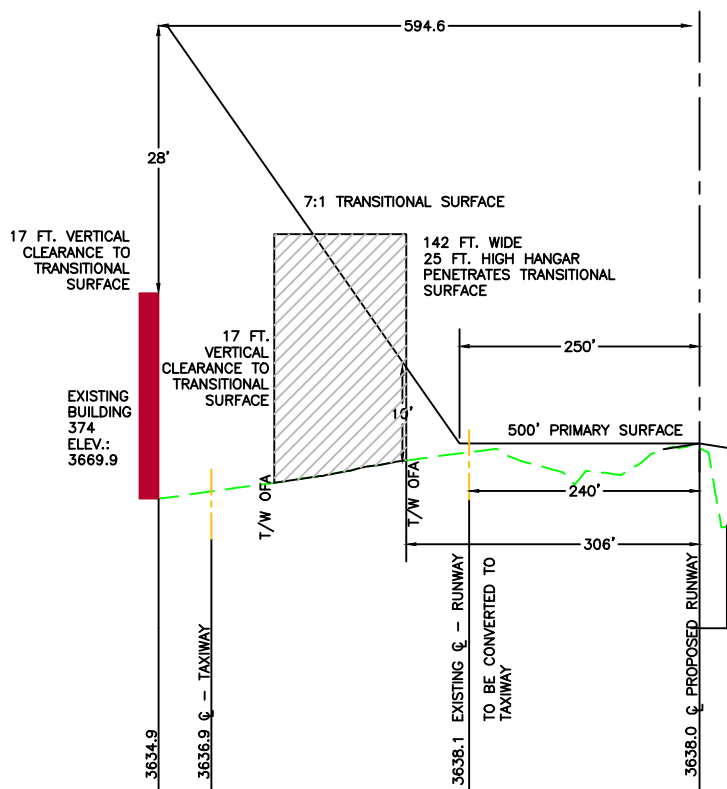
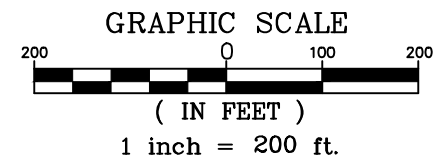
NO.	DESCRIPTION	DATE	BY



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REPRESENTS ORIGINAL
DRAWING.
MODIFY SCALE
ACCORDINGLY



ALTERNATIVE 3 RELOCATE RUNWAY CENTERLINE 240 FEET EAST, 600 FEET NORTH



3.5 ALTERNATIVE 3A – Relocate Runway 240 Feet East, Shift Threshold 1550 Feet to the North:

Alternative 3A includes:

- Relocating runway 240 feet east of existing alignment at initial length of 4200 feet,
- Shifting the Runway 34 threshold 1550 feet to the north in initial phase,
- 1000 foot extension of runway in Phase 2 to the north, for ultimate 75-foot x 5,200-foot runway,
- Relocating the PAPIs, and installing new runway lighting.
- Acquiring approximately 82 acres for runway development and safety areas initially and 20 acres additional in Phase 2.
- Acquiring or zone approximately 112 acres for compatible land use (65 DNL boundary outside of the minimum required land acquisition),
- Maintaining current weight bearing capacity of 17,000 pounds,
- Relocating Stock Farm Road in Phase 2 to provide clear Runway Protection Zone and Approach Surface.
- Converting existing runway into parallel taxiway.

3.5.1 ANALYSIS

By moving the runway 240 feet east, the building restriction line also moves further east, which in turn, removes the existing structures from the Part 77 Transitional Surfaces.

By moving the runway 240 feet east, the building restriction line also moves further east, which in turn, removes the existing structures from the Part 77 Transitional Surfaces. This alternative does not, however, provide the setback distance required for new hangar construction west of the existing runway and east of the existing parallel taxiway. Hangar construction in this area would penetrate the Transitional Surface as shown on the exhibit “Relocate Existing Runway Alternative 3A” and Drawing “ALT 3A.” One additional hangar may be constructed at the south end of the parallel taxiway, as identified on Drawing “ALT 3A.” Modifications to the hangar layout may achieve a layout that would provide for additional hangar spaces, but likely at the expense of reducing available ramp area.

This alternative also provides for the development of a sizeable apron expansion to the west of the existing runway. While this space would be large enough to allow for flexibility in hangar location, taxiway location, and staging of apron construction, it is not the most advantageous type of layout for an apron due to the long narrow nature of the proposed area. Such a layout would reduce the ability to nest planes together in several rows and likely only provide for one row of planes to be parked wing to wing, or possibly up to one row of planes nested (wing to tail parking).

Noise exposure on the neighborhood south of the airport would be improved compared with Alternatives 1, 2, 2A, 3 and 4 due to the larger northern shift in the runway threshold.

The threshold shift of 1550 feet in the initial phase removes the Daily Ditches Irrigation District property from the RPZ and removes the structures on the property from penetrating Part 77 imaginary surfaces. This eliminates the need to acquire the property and relocate the historic structures.

This alternative would require the relocation of a portion of Stock Farm Road in order to provide clearance for the Part 77 approach surface.

Alternative 3A could allow for the airport to remain open during the majority of the runway construction with limited runway closures or night work while connecting the new runway to the exiting runway and taxiways.

This alternative would require acquisition of 102 acres of land to the north and east for the extension and relocation of the runway, and acquisition or rezoning of 112 acres of land for compatible land use.

3.5.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 3A shifts the Runway 34 threshold 1550 feet further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of “moderate” for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made. Conceptual mitigation includes land acquisition of those parcels along the easterly boundary of the airport that would be impacted by noise levels beyond the acceptable threshold limits.

Alternative 3A may result in displacement of species that utilize the Gird Creek riparian area and the upland areas adjacent to the existing airport development area as cover, forage, breeding and movement habitat. However, large quantities of adjacent suitable habitat exists that can support species that are displaced by construction activities and the resulting modification of the project area. Therefore no adverse effects to general wildlife species are anticipated.

Due to the 1550’ shift northward, this alternative provides clearance of FAR Part 77 imaginary surfaces for the two historic airplane hangars known as the Daly Ditches Irrigation buildings. Therefore, this alternative does not require the removal or relocation of the historic buildings resulting in elimination of impacts to cultural resources and reduced project costs.

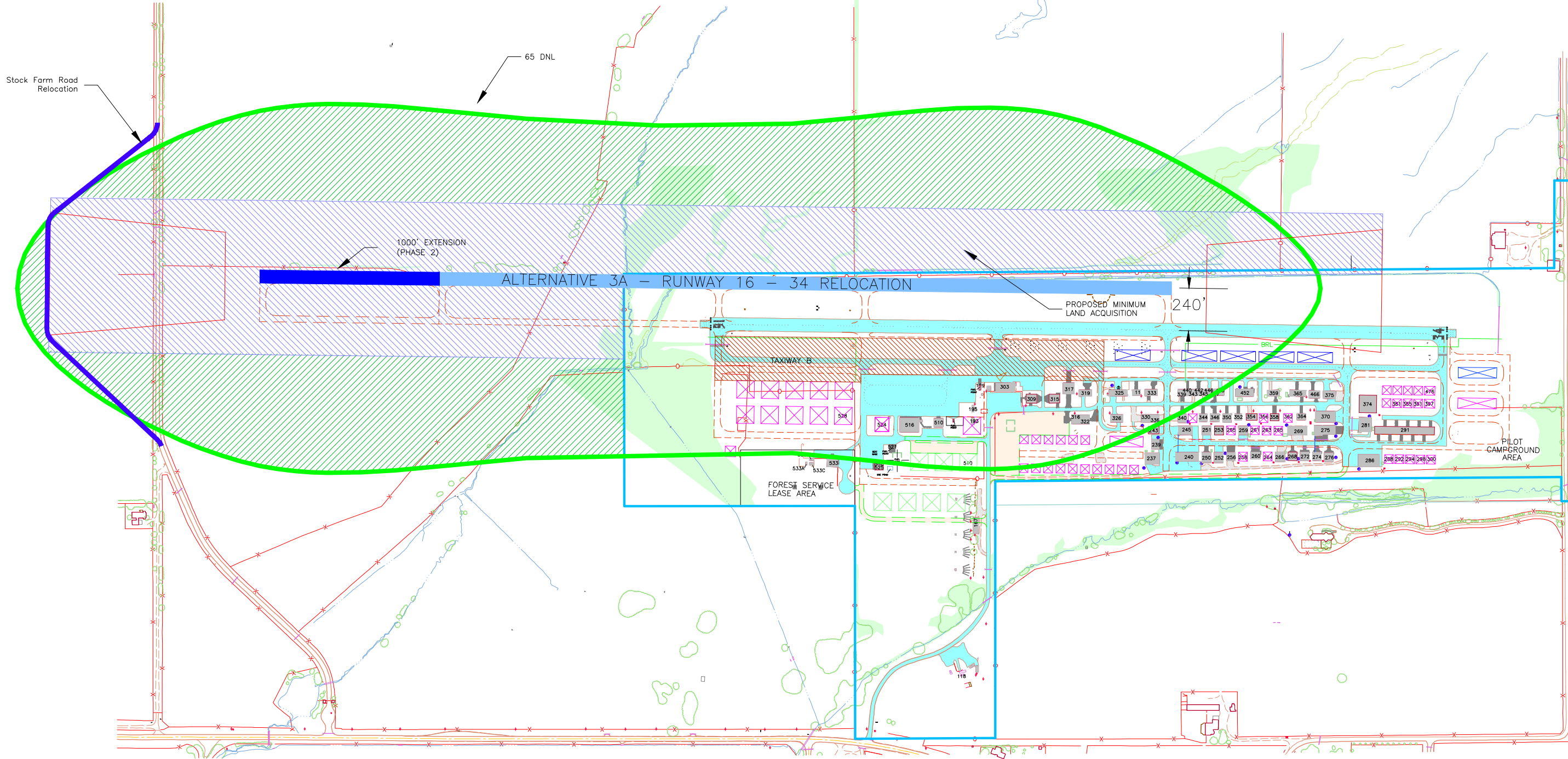
Based on wetland delineation and jurisdictional determination by the Army Corps of Engineers (COE), it was determined that the proposed improvements could impact up to 2.04 acres of wetlands. The proposed improvements would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing

an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available for the proposed action within the same watershed as the airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

3.5.3 CONCLUSION

Alternative 3A meets FAA design standards for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years. Alternative 3A provides additional hangar and apron space compared with Alternatives 2 and 2A. Implementation of Alternative 3A does not produce significant impacts to the environmental categories identified for evaluation under NEPA. In contrast to Alternatives 2, 3 and 4, Alternative 3A does not require removal or relocation of the Daly Ditches Irrigation buildings resulting in reduced impacts to cultural resources and reduced project costs.

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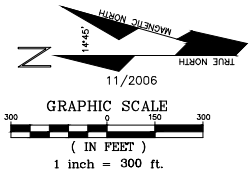
NOTES:

1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).
2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.
3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.
4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.
5. LARGE RPZ UTILIZED (500 X 700 X 1000)
6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE AND THE EXTENTS OF THE RUNWAY PROTECTION ZONE.

LEGEND	
	MINIMUM REQUIRED LAND ACQUISITION **
	COMPATIBLE LAND USE AREA ***

MINIMUM REQUIRED LAND ACQUISITION **	102.0 ACRES
COMPATIBLE LAND USE AREA ***	112.0 ACRES

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.
*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.



LEGEND	
	EXISTING FUTURE
PAVEMENT	
BUILDING	
BUILDING AFTER RW RELOCATION	
AVIATION RELATED BUSINESS	
FENCE	
GRAVEL	
AIRPORT BOUNDARY	
ADJACENT PROPERTY	
OFA (OBJECT FREE AREA)	
OPZ (OBSTACLE FREE ZONE)	
RPZ (RUNWAY PROTECTION ZONE)	
RSA (RUNWAY SAFETY AREA)	
BRL (BUILDING RESTRICTION LINE)	
IRRIGATION DITCH / CREEKS	
WETLANDS	
CONTROL POINT	
AIRPORT REFERENCE POINT	
POTENTIAL APRON EXPANSION	
AREA REQ'D MIN. LAND ACQUISITION	
65 DNL AREA OUTSIDE ALP BOUNDARY	

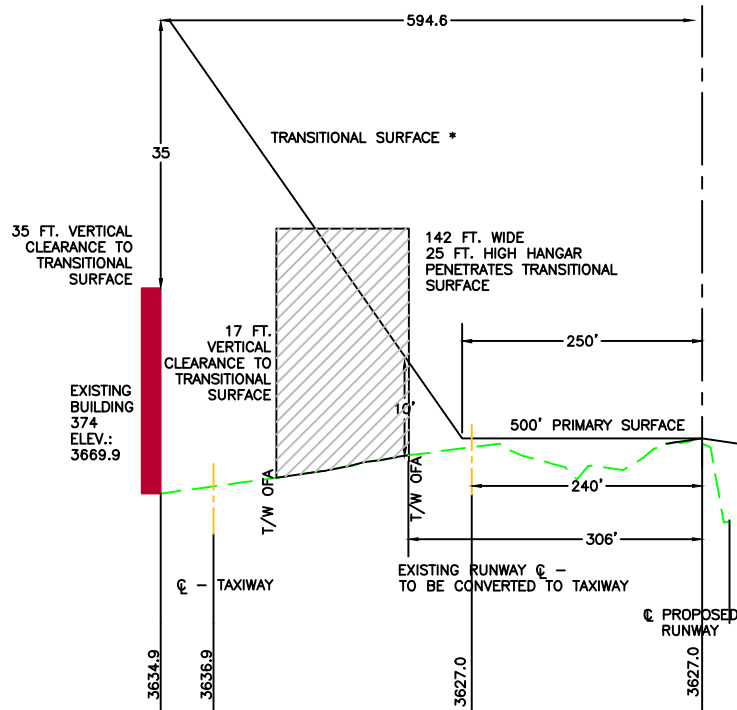
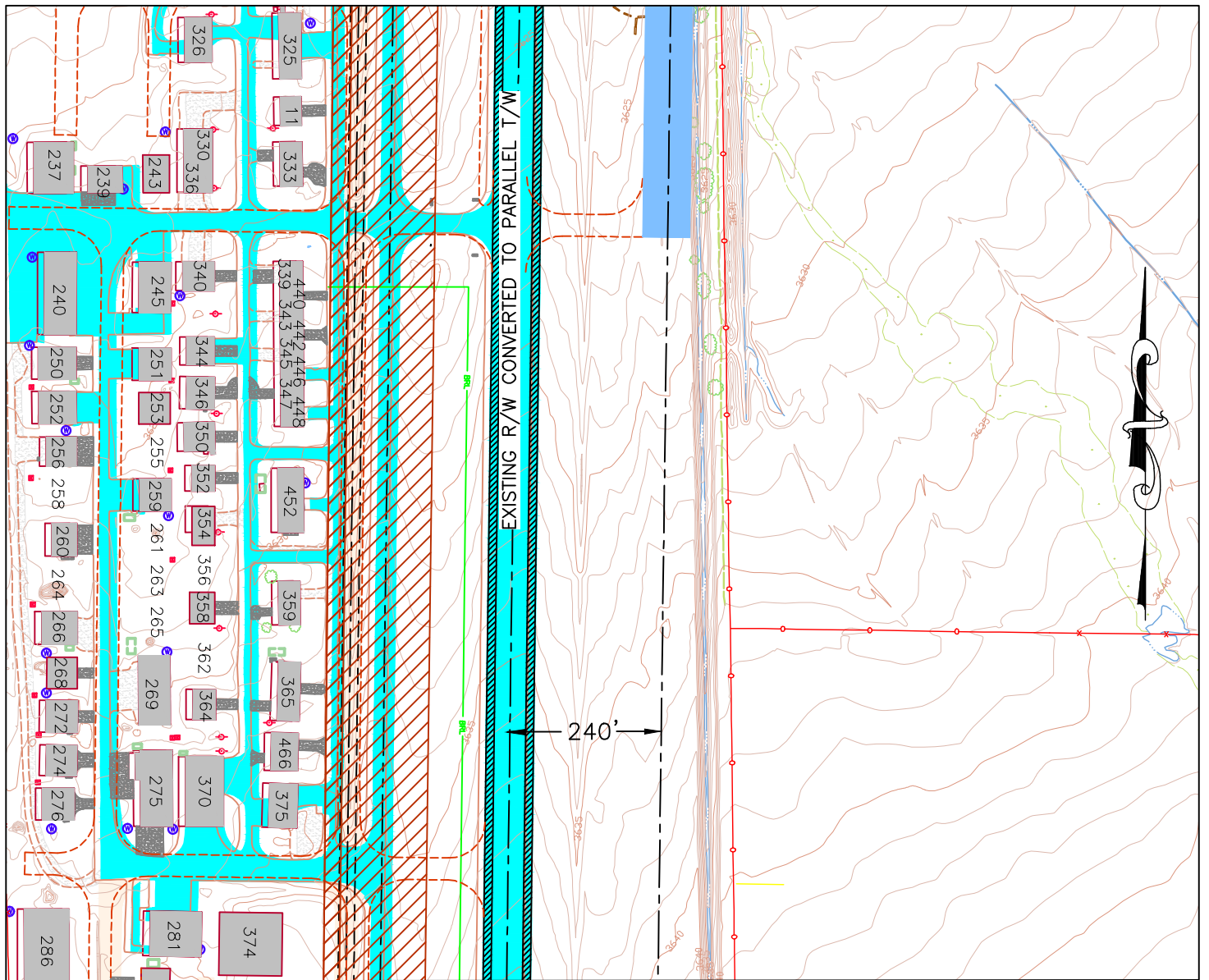
RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT
HAMILTON MONTANA
ALTERNATIVE 3A

NO.	DESCRIPTION	DATE	BY

ENGINEERS
SURVEYORS
PLANNERS
SINCE 1945
**MORRISON
MAERLE, INC.**
An Employee-Owned Company
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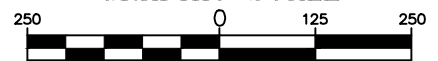
DRAWN BY: TJE	CHK'D BY: MAM
APPR. BY: STB	DATE: 10-09
BY: O.A. REVIEW	DATE:

VERIFY SCALE!
THESE PRINTS MAY BE
REDUCED. LINE BELOW
REPRESENTS ORIGINAL
DRAWING.
SCOTT T.
8123 PE
PROFESSIONAL
MONTANA
MODIFY SCALE
ACCORDINGLY



ALTERNATIVE 3A
RELOCATE RUNWAY
CENTERLINE 240 FEET EAST,
1550 FEET NORTH

GRAPHIC SCALE



(IN FEET)
1 inch = 250 ft.

* TRANSITIONAL SURFACE SLOPE INCREASES ABOVE 7:1 TO MEET
APPROACH SURFACE BEGINNING 200' BEYOND RUNWAY END

MORRISON MAIERLE INC. 20 New 111th St., Tempe, AZ 85284 • Phone: (480) 987-0232 • Fax: (480) 987-1174 CLIENT: RAVALLI CO.		Project: Date: Scale: Drawn By: Checked By:
FIELD WORK: DRAWN BY: GMC CHECKED BY: STB		DATE: 05/24/10 SCALE: 1" = 200' PROJ. #0827

RAVALLI CO. AIRPORT EA RELOCATE R/W 240' EAST ALTERNATIVE 3A	
PLOTTED DATE: May/25/2010 - 07:43:03 am DRAWING NAME: NO. 0827 RAVALLI CO. 2009\PROJECTS\RUNWAY RELOCATION.dwg SHEET 2 OF 3	PLOTTED BY:

3.6 ALTERNATIVE 4 – Relocate Runway 400 Feet East, Shift Threshold 600 Feet to the North:

Alternative 4 includes:

- Relocating runway 400 feet east of existing alignment at initial length of 4200 feet,
- Shifting the Runway 34 threshold 600 feet to the north in initial phase,
- 1000 foot extension of runway in Phase 2 to the north, for ultimate 75-foot x 5,200-foot runway,
- Relocating the PAPIs, and installing new medium intensity runway lighting system,
- Converting and extending the present runway to a parallel taxiway once the new runway alignment is available for use.
- Acquiring 110.3 acres of land for runway, apron, taxiway, and hangar development.
- Acquiring up to 95.2 acres of land through easement for compatible land use (65 DNL boundary outside of the minimum required land acquisition).

3.6.1 ANALYSIS

A major portion of the existing runway could be used for the new parallel taxiway. This option allows for a runway protection zone to be unobstructed with an ultimate 5,200-foot runway length and a 75-foot width.

By developing a new runway 400 feet east of the existing runway as shown on the approved Airport Layout Plan instead of the 240 feet proposed in Alternative 3, the airport could gain a 230-foot wide apron for the entire front line for tie-down and hangar space. While this alternative does provide for a smaller apron area than in Alternative 3, it does provide for greater flexibility and efficiency in the possibilities for the parking of aircraft. The reduction in area for future apron expansion when comparing Alternative 3 to Alternative 4 is due to the fact that apron area available under Alternative 3 is now available for hangar development under Alternative 4. Of all the alternatives, Alternative 4 provides the greatest flexibility in changing hangar space to apron area or converting apron area to hangar space.

This alternative, as well as Alternative 3, would permit the airport to remain open during the runway construction period.

This alternative would require acquisition of 110.3 acres of land to the north and east for the extension and relocation of the runway, and acquisition or rezoning of 95.2 acres of land for compatible land use.

3.6.2 ENVIRONMENTAL IMPACTS/MITIGATION

Alternative 4 may result in displacement of species that utilize the Gird Creek riparian area and the upland areas adjacent to the existing airport development area as cover, forage, breeding and movement habitat. However, large quantities of adjacent suitable habitat exists that can support species that are displaced by construction activities and the resulting modification of the project area. Therefore no adverse effects to general wildlife species are anticipated.

This alternative requires the removal or relocation of two historic airplane hangars known as the Daly Ditches Irrigation buildings in order to provide clearance of FAR Part 150 imaginary surfaces. A cultural resources mitigation plan has been developed to mitigate the project's adverse effects to the buildings. Acceptance and approval of the cultural resources mitigation plan would result in the elimination of impacts to cultural resources that would result from implementation of Alternative 4.

This alternative shifts the Runway 34 threshold 600' further to the north and away from Tammany Lane. Shifting of the threshold increases the height of aircraft on approach from the south over the neighborhood to the south. While this has the potential to reduce the noise over the neighborhood, noise is still an affected environment that was determined to have a rating of "moderate" for this option. This alternative could result in increased noise levels as the airport could potentially experience increased traffic volumes, regardless of what improvements may be made. Conceptual mitigation includes land acquisition of those parcels along the easterly boundary of the airport that would be impacted by noise levels beyond the acceptable threshold limits.

Based on wetland delineation and jurisdictional determination by the Army Corps of Engineers (COE), it was determined that the proposed improvements could impact up to 1.72 acres of wetlands. The proposed improvements would require securing an individual Clean Water Act Section 404 permit prior to project development. Securing an individual permit would require construction or acquisition of compensatory mitigation (at a ratio established by COE). An evaluation of mitigation alternatives for the project site has concluded that compensatory mitigation is available for the proposed action within the same watershed as the airport. The project shall secure compensatory mitigation through one or more means, including the Teller Wildlife Refuge, on County-owned property, or on privately-owned property. Securing compensator mitigation will result in no adverse effect to wetland resources in the area of the airport for the proposed action. Appendix IX – *RCA Wetland Delineation Report* can also be referenced for the wetland delineation of the Ravalli County Airport property.

3.6.3 CONCLUSION

Alternative 4 provides for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years and for the additional apron and hangar space necessary to accommodate current and future growth. Implementation of Alternative 4 does not produce significant impacts to the environmental categories identified for evaluation under NEPA.

3.6 Selection of Preferred Alternative

Alternatives 1, 2, 3 and 4 were originally evaluated as a part of this Environmental Assessment. In response to issues raised during the public participation process Alternatives 2 and 3, were modified and added as Alternative 2A and 3A.

With the exception of Alternative 1, the “No Action” alternative, all alternatives meet the purpose and need of providing improvements to Ravalli County Airport to meet FAA design standards for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years.

None of the six alternatives produce significant impacts to the environmental categories identified for evaluation under NEPA. Due to an increased shift of the runway threshold to the north, Alternatives 2A and 3A provide lesser impacts in the categories of noise and cultural resources.

Following detailed review of the alternatives and considerable public debate, the Ravalli County Commission voted on April 7, 2010 to select Alternative 2A as the preferred alternative. Meeting minutes are included in Appendix XII.

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NOTES:

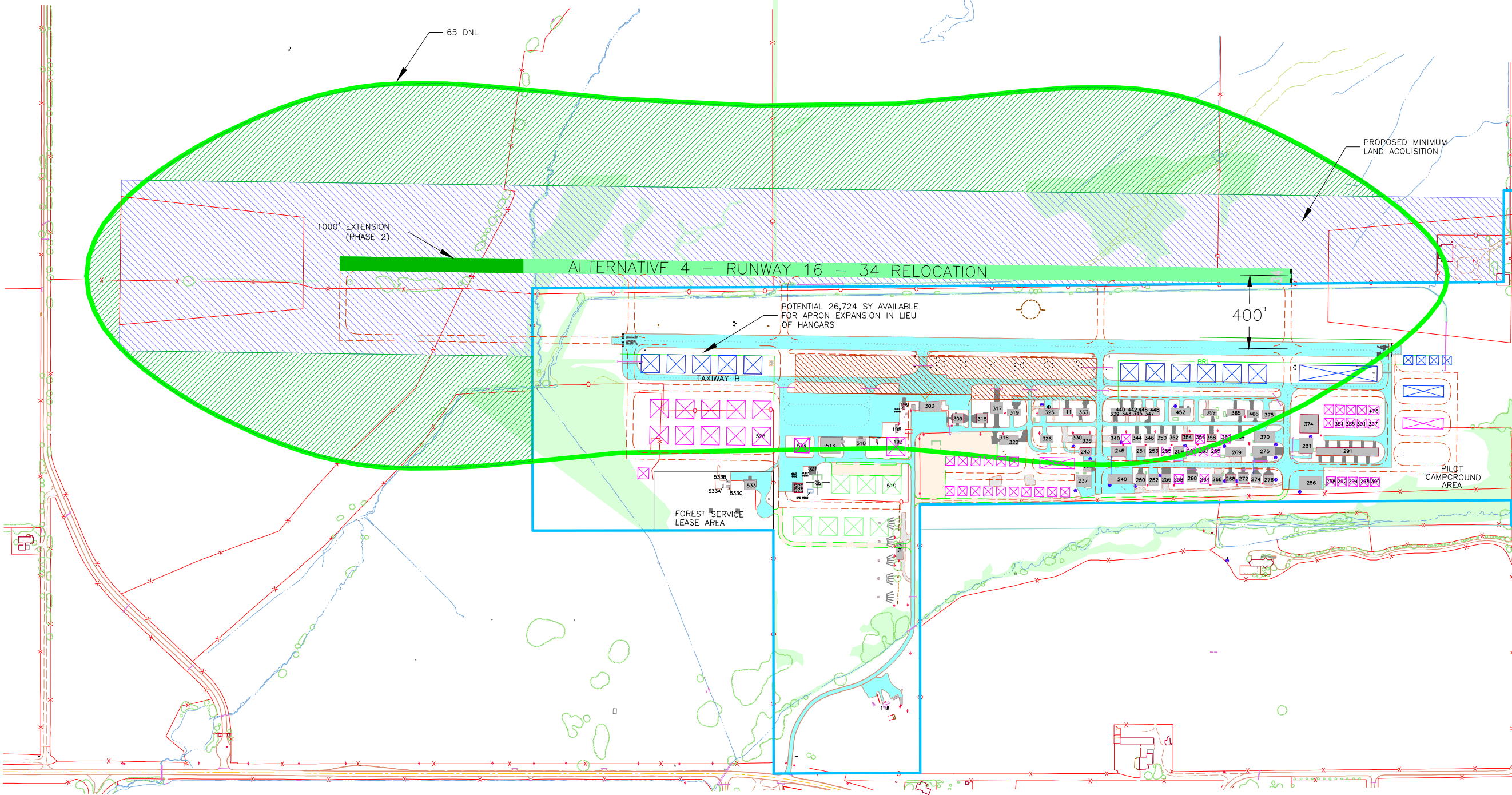
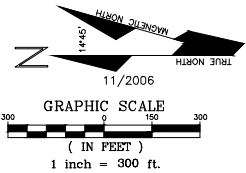
1. LIMITS OF THE BUILDING RESTRICTION AREA WERE CALCULATED USING A 1% DOWN GRADIENT FROM THE EXISTING RUNWAY CENTERLINE (1% ROUGHLY MATCHES THE FALL OF EXISTING GROUND).
2. A PRIMARY SURFACE WIDTH OF 500 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA AND AREAS OF POTENTIAL APRON CONSTRUCTION.
3. A TAXIWAY OBJECT FREE AREA OF 131 FEET WAS UTILIZED IN CALCULATING AREAS OF POTENTIAL APRON CONSTRUCTION.
4. A BUILDING HEIGHT OF 21 FEET WAS UTILIZED IN CALCULATING THE BUILDING RESTRICTION AREA ALONG THE WEST SIDE OF THE RUNWAY. A BUILDING HEIGHT OF 27 FEET WAS UTILIZED ALONG THE EAST SIDE OF THE RUNWAY TO PROVIDE FOR ADDED APPROACH/OBSTRUCTION PROTECTION.
5. LARGE RPZ UTILIZED (500 X 700 X 1000)
6. LAND ESTIMATE FOR MINIMUM REQUIRED AREA BASED ON 440 FEET EITHER SIDE OF THE PROPOSED RUNWAY CENTERLINE AND THE EXTENTS OF THE RUNWAY PROTECTION ZONE.

LEGEND	
	MINIMUM REQUIRED LAND ACQUISITION **
	COMPATIBLE LAND USE AREA ***

MINIMUM REQUIRED LAND ACQUISITION **	110.3 ACRES
COMPATIBLE LAND USE AREA ***	95.2 ACRES

** MINIMUM REQUIRED LAND DOES NOT INCLUDE ALL THE 65 DNL LAND. THIS LAND MAY BE ACQUIRED THROUGH EASEMENT VERSUS FEE TITLE.
*** AREA OUTSIDE MINIMUM REQUIRED LAND ACQUISITION ENCOMPASSED BY 65 DNL.

LEGEND		EXISTING	FUTURE
PAVEMENT			
BUILDING			
BUILDING AFTER RW RELOCATION			
AVIATION RELATED BUSINESS			
FENCE			
GRAVEL			
AIRPORT BOUNDARY			
ADJACENT PROPERTY			
OFA (OBJECT FREE AREA)			
OPZ (OBSTACLE FREE ZONE)			
RPZ (RUNWAY PROTECTION ZONE)			
RSA (RUNWAY SAFETY AREA)			
BRL (BUILDING RESTRICTION LINE)			
IRRIGATION DITCH / CREEKS			
WETLANDS			
CONTROL POINT			
AIRPORT REFERENCE POINT			
POTENTIAL APRON EXPANSION			
AREA REQ'D MIN. LAND ACQUISITION			
65 DNL AREA OUTSIDE ALP BOUNDARY			



RAVALLI COUNTY AIRPORT
ENVIRONMENTAL ASSESSMENT

MONTANA

HAMILTON

ALTERNATIVE 4

PROJECT NO.
0877
SHEET NUMBER
ALT 4
DRAWING NUMBER

ALT 4

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An Employee-Owned Company
2621 South Clark Street, Missoula, MT, 59801
Phone: (406) 542-8880 Fax: (406) 542-0009
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ENGINEERS
SURVEYORS
PLANNERS
SINCE 1945

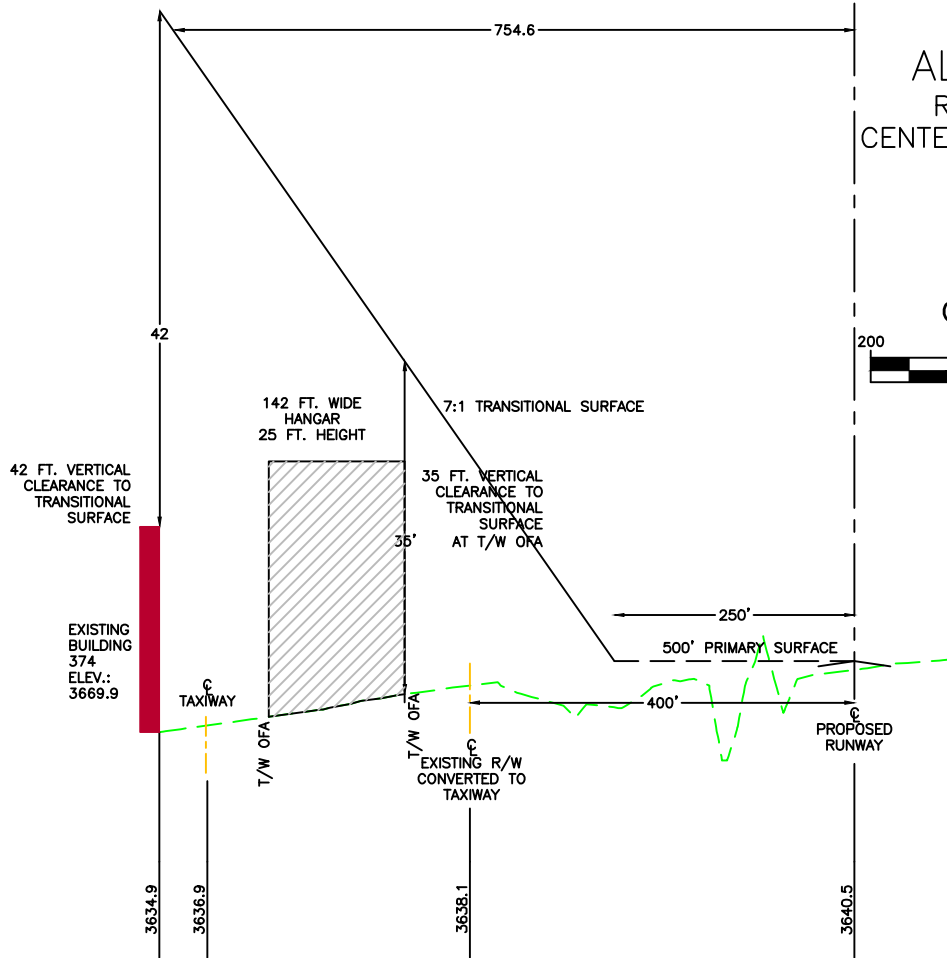
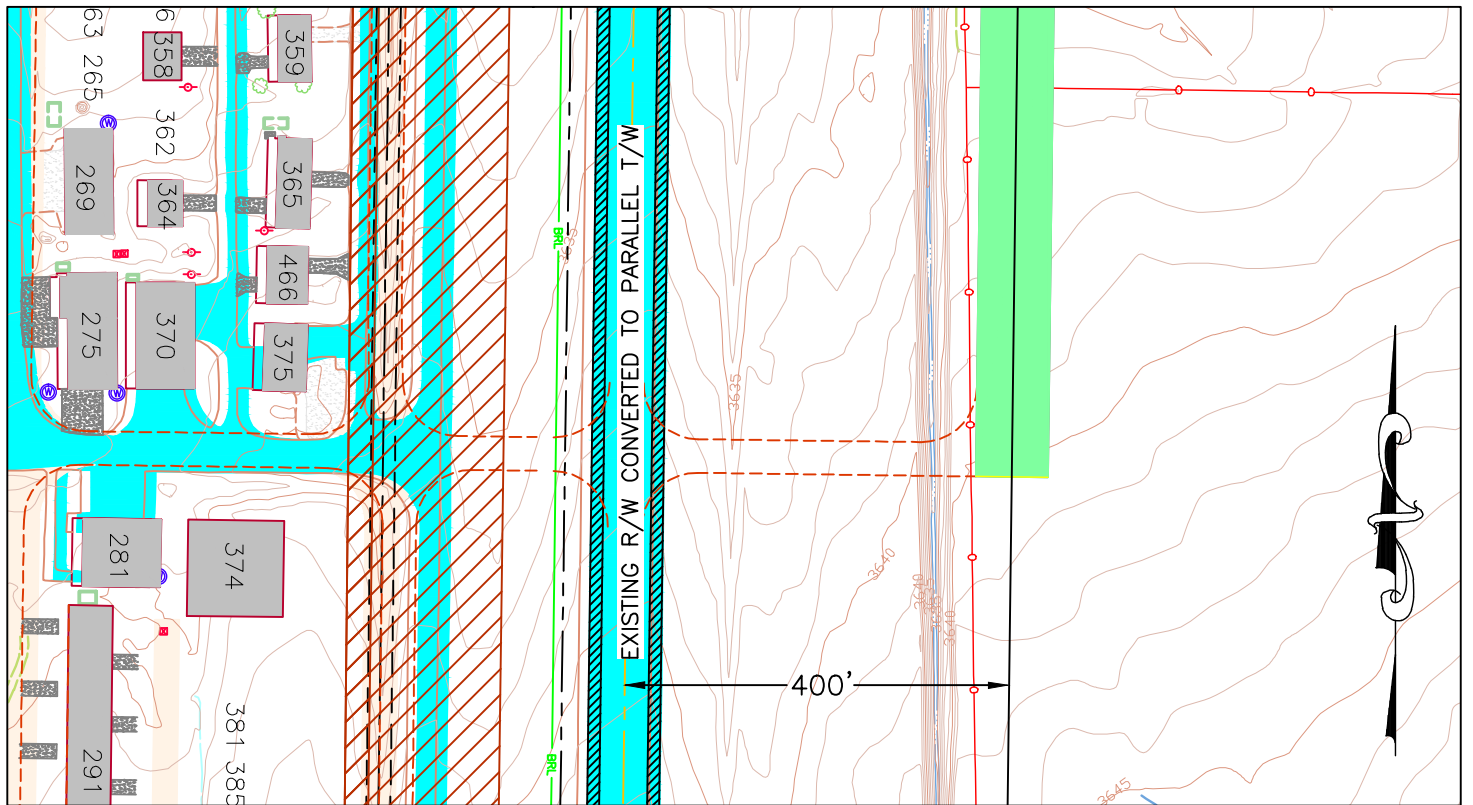
DRAWN BY: TJE
CHK'D BY: MAM
APPR. BY: STB
DATE: 10-09
BY: O.A. REVIEW
DATE:

NO.	DESCRIPTION	DATE	BY



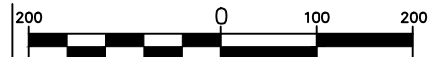
VERIFY SCALE
THESE PRINTS MAY BE
REDUCED. LINE BELOW
REPRESENTS ORIGINAL
DRAWING.

MODIFY SCALE
ACCORDINGLY



ALTERNATIVE 4 RELOCATE RUNWAY CENTERLINE 400 FEET EAST, 600 FEET NORTH

GRAPHIC SCALE



(IN FEET)
1 inch = 200 ft.

MORRISON MAIERLE INC. <small>2000 N. 11th St., Suite 200, Phoenix, AZ 85016 • Phone (480) 987-0271 • Fax (480) 987-1178</small> CLIENT: RAVALLI CO.		Drawn Checked Approved Plotted Date: 5/24/10 Scale: 1" = 200' Proj: #0877
FIELD WORK: DRAWN BY: GMC CHECKED BY: STB	DATE: 5/24/10 SCALE: 1" = 200' PROJ: #0877	PLOTTED DATE: May/25/2010 - 07:43:57 am DRAWING NAME: N:\0877\SAVADO 2009\0877\RUNWAY RELOCATION.dwg SHEET: 3 OF 3

RAVALLI CO. AIRPORT EA
RELOCATE R/W 400' EAST
ALTERNATIVE 4